

NASA Langley Research Center is actively seeking partnerships and collaborations to commercialize its Giant Magnetoresistive Crack Detector technology.

## The Market Opportunities

The newly discovered giant magnetoresistive (GMR) technique to identify surface cracks is a nondestructive evaluation method to solve common industry crack-detection problems. Thick, multilayer metal structures, such as wing splices in heavy transport aircraft, present one of the most difficult problems in nondestructive inspection.

This invention can be used to look for subsurface cracks in:

- Manufacturing plants/structures
- Aircraft
- Boilers
- Bridges
- Cranes and other trussed structures
- Marine nuclear propulsion systems
- Nuclear power generation equipment
- Pipelines
- Rail equipment
- Rotating shafts
- Storage tanks

## The Benefits

Multiple layers are not a problem for eddy-current inspection, but existing eddy-current methods can penetrate only the first few millimeters of metal. Now, with the GMR crack detector, deeper cracks can be identified. Other benefits include:

- Reliable identification of cracks up to 10 mm (0.4 inches) deep
- Economical method to detect subsurface cracks
- Detection of small fatigue cracks over large areas before widespread damage occurs

## GMR Crack Detector

Deep Flaw Detection Equipment



## The Technology

This new system uses a magnetoresistive sensor, instead of the usual wire coil, to detect the eddy-current response. The magnetoresistive sensor makes it possible to work at low frequencies (10 to 50 Hz) where the electromagnetic fields penetrate deep into the metal. In addition, the applied-field coil has a special geometry that maximizes the flaw signature, minimizes the background signals from steel fasteners, eliminates lift-off errors, and cancels interference from nearby plate edges.

## Additional Information

*To discuss in detail how this technology can profit you and your business, please contact:*

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